Botanical Gazette.

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EDITORIAL.—A distinguished botanist has said, "He who demolishes a false species does better service than one who establishes a new one." Of the truth of this there can be no doubt, but the trouble lies in its application. We venture to assert that if there was any way by which such distinguished service could be permanently recorded with the change, as there is when a new species is made, that just as many botanists would be earnestly trying to destroy species as are now eager to establish new ones.

PROF. ALPHONSO WOOD died at his home at West Farms, N. Y., January 4th, at the age of 71. Prof. Wood's name is known throughout the country wherever the science of Botany is studied. His Textbooks and Manuals were very popular and found a warm reception in very many schools and botanical libraries. His whole object in arranging and describing species seemed to be to make it easy for beginners to find the names. While, of course, no such thought should enter into the writing of a strictly scientific description, it is very refreshing to the puzzled student sometimes to turn from such a one to another from which all difficulties have been cleared away and characters used that any one can see It was for this reason that Prof. Wood's books found such ready sale and such probably was the sole spirit of his work. As a scientific botanist his work can never rank very high, but as an educator his name will always be remembered.

A NOTE IN *Nature* says that a plant recently introduced by accident into Queensland (*Xanthium strumarium*) is giving trouble to the colonists on account of its poisonous effects on cattle. Extract of the plant being administered for experiment produced torpidity gradually increasing till without struggling or excitement the breathing ceased, after which the heart's action became feeble and stopped. From smaller doses the animals recovered. Extracts of *X spinosum* gave similar results. Does any one know whether cattle in this country eat these weeds, and if so, whether any ill effects are noticeable?

M. HENRY POLONIE has advanced the theory that the gritty particles near the core in pears and allied fruits, called sometimes "stone-cells," are the rudimentary remains of a stone enclosing the seeds of some ancestor of our present pears. The theory is supported by the fact that a series of fruits can be made in which there is a regular gradation from almost no stone-cells to where they are in contact and form a kind of casing for the seeds; and also some related genera have stony fruits.

PROF. W. W. BAILEY is preparing a "Botanical Collector's Handbook," which is to be published by Geo. A. Bates of Salem, Mass.,

and issued in the early spring. There could be no one better fitted for giving directions for collecting and preserving plants than Mr. Bailey, and aided as he is by others who have had long experience, the book will undoubtedly be all that it claims. Such a work has never been published in this country and when it has come into use botanical collectors will wonder how they ever did without it. To secure copies early and promptly orders should be sent on to the publisher at once. The price is $1.50.

BERNARD QUARITCH, 15 Piccadilly, London, is advertising three very rare and costly botanical works. They are Elwes' Monograph of the genus *Lilium*, in 7 parts, royal folio, colored plates of every known species of the genus, for £7, 7*s*.; Clarke's Commelynaceæ et Cyrtandraceæ Bengalenses, royal folio, 95 plates, for £1; Boott's Illustrations of the Genus Carex, 4 vols. folio, 600 plates, for £21.

OUR EXCHANGE DRAWER is filled this month with a lot of publications that are very common in this enterprising country. There are "Floral Cultures," "Floral Instructors," "Floral Albums." "Horticultural Reviews," etc., etc., all printed on flimsy paper, with wretched typography and still more wretched matter, yet all claiming to be indispensable and authoritative. Scraps of doggerel, senseless correspondence and sickly sentiment go to make up the contents of these valuable periodicals. How people can be deluded enough to publish such stuff, or, still worse, subscribe for it, is more than we can understand.

CAREX SULLIVANTII, Boott., A HYBRID.—During the past twelve months I have distributed a considerable number of *Carex Sullivantii* among U. S. botanists, at first without suspecting it to be other than a true species, but later with the honest conviction that it is a hybrid. My views were communicated to Prof. Gray in June last, and he urged me to make them public, which is the object of this communication.

This pseudo-species was discovered by Sullivant, at Columbus, Ohio, nearly forty years ago, in one small spot growing with *C. gracillima* and *C. pubescens*. Its barren perigynia led him to suspect it might be a hybrid between these two species. He subsequently transplanted it into his garden, where he watched it for several years, but could never find mature achenia. Dr. Boott says "achenia abortive."

Dr. S. H. Wright, (Penn Yan, N. Y.,) to whom I am indebted for the above *resume*, adds: "I think you are the only person who has since found it; and, as the abortive fruit in your plants makes your experience with it the same as Sullivant's, together with the fact that it has lain nearly forty years before re-discovery, renders the conclusion, that it is a hybrid, a pretty safe one."

The re-discovery of this plant was in June, 1879. I found it in a low meadow near the bank of a swampy stream, in the midst of *C. gracillima* and *C. pubescens*. That it partakes of the character of both these species there can be no doubt whatever. Of the former are its spikelets, of the latter its perigynia, though smaller. At flowering

time the stigmas are well developed, but not sufficiently glutinous to hold pollen. The anthers are exceedingly small, and show no signs of dehiscence until about two weeks after the stigmas are dry, at which time the pollen is shrunken, and apparently lifeless. If the grains examined contained fluid, it escaped detection: Frequent observations of the plant in its habitat were made, as well as a close study of its essential parts under the microscope.

The foregoing facts seem to lead to but one conclusion, namely, that the plant is a hybrid.—E. C. Howe, *Yonkers, N. Y.*

Carnivorous Plants. III.—Experiment No. 6.—Placed upon a leaf, which had had the sunlight during the morning, a larva (same as in No. 5), at 2 P. M., June 6, '79.

20 min. the submarginal t. nearest the specimen had approached and touched it; the marginal t. on one side had moved through an angle of 45°.

80 " continued movement of those t. nearest the larva, many being closed upon it; no further change was perceptible in the marginal t.

112 " the submarginal t. opposite those mentioned before, have moved considerably; movement among the disk t. perceptible.

3 hrs. no change from the last.

20 " considerable movement among all the t; the submarginal mostly closed upon the specimen; all but about 6 or 8 of the marginal bent over toward the object.

22 " about the same as the last.

29 " all the submarginal, the edge of the leaf nearest the specimen, and some of the marginal t. much inflected.

67 " no change.

73 " a slight reflex action is noticeable.

94 " the marginal and submarginal t. were wholly reflexed; disk t. partly so.

109 " completely reflexed.

126 " leaf with secretion on the t.; perfectly natural.

Experiment No. 7.—Placed upon a leaf, which had had sunlight during the forenoon, a minute piece of wood at 2 P. M., June 6, '80.

20 min. 10 or 12 of the submarginal t. were inflected, and three or 4 of these touched the specimen.

80 " some further movement of the submarginal t. on one side; elsewhere no perceptible change; a few t. situated on the petiole had moved somewhat.

112 " the submarginal and disk t. had moved but little from the last.

3 hrs. no change from the last.

20 " no perceptible change.

29 " an apparent reflex action, although slight.

69 " all the t. were reflexed.

84 " leaf with secretion on the t.; perfectly natural.

EXPERIMENT No. 8.—Placed a cube (edge 1-16 inch) of hardened egg albumen upon the disk of a leaf, at 2.45 P. M., June 10, 1879.

30 min. perhaps there had been a slight movement of the disk tentacles, but none of the others showed any change.

2 hrs. evident movement of the disk tentacles.

17 " the edge of the leaf and all of the disk, submarginal and marginal tentacles were inflected and touched the specimen, except the tentacles and edge of the leaf on one side for about one fourth of the circumference.

24 " all the tentacles except five or six of the marginal, and the entire edge of the blade, were inflected*; egg all softened, opaque but not viscid.

41 " entirely closed except two of the marginal tentacles.

47 hrs. several of the marginal tentacles were reflexed; a soft and viscid semi-fluid substance is all that remains of the egg.

67 hrs. the marginal tentacles, with the exception of two or three, were standing at an angle of 90° with the blade, the sub-

*The margin of the blade of the leaf is often more or less incurved, according to the substance undergoing absorption; apparently if the matter is easily absorbed the whole leaf seems to be excited and all parts are brought into action. In this case, however, the method of incurving was somewhat peculiar, and I am not aware that it has ever been recorded. When fully inflected the blade was pentagonal in outline. (Fig. 1.)

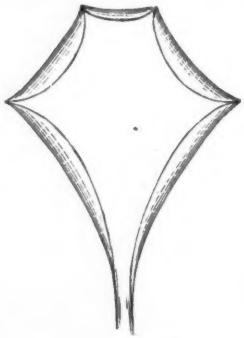

FIG. 1. (3X)

To the intense exertion on the part of the leaf to assimilate all the absorbable matter contained in the substance placed upon the disk; to the undue excitement caused by an over-dose of an easily absorbed food, I am led to ascribe, as the direct cause, the death of the leaf, noted at the end of the experiment.

Three other forms of marginal incurvation are mentioned by Darwin. [Insectivorous Plants, p. 12.]

"For instance, I placed bits of hard-boiled egg on three leaves; one had the apex bent towards the base; the second had both distal margins much incurved, so that it became almost triangular in outline, and this perhaps is the commonest case; while the third blade was not at all affected, though the tentacles were as closely inflected as in the two previous cases. The whole blade also generally rises or bends upwards, and thus forms a smaller angle with the foot-stalk than it did before. This appears at first sight a distinct kind of movement, but it results from the incurvation of that part of the margin which is attached to the foot-stalk, causing the blade, as a whole, to curve or move upwards."

stance remaining of the egg adhering to them as a white opaque mass.

74 hrs. the same as the last except the substance on the tentacles has turned brown.

91 " the marginal tentacles were all reflexed except those on one side where they were held by the viscid substance mentioned above.

98 hrs. all the submarginal tentacles, for at least one half the circumference, standing at an angle of 90° with the blade.

137 hrs. the tentacles were nearly all reflexed, and those that were not were simply held back by the remaining substance of the egg.

148 hrs. the leaf was expanded but somewhat stuck together in parts by remains of egg; the leaf seemed almost lifeless; the tentacles were shrunken and with no secretion; however, *the remainder of the plant seemed to be in a more thriving condition than at the opening of the experiment.*

186 hrs. the substance on the leaf had become fibrous; leaf fully expanded; no secretion.

195 hrs. the leaf on one side was so covered with the fibrous substance, mentioned in the last note, as to appear quite dead.

220 hrs. the leaf was apparently rapidly dying.

316 " the leaf was completely dead and covered with a mold.*

AN EASILY MADE OBSERVATION.—Several years since I constructed a couple of simple machines for measuring the longitudinal growth of plants which were so effective for work and so easily made withal that it may be well to describe them for the benefit of pupils who may wish to make some experiments. They were essentially the same as the arc indicator described by Sachs in his Text Book. My arc indicators consisted of square pieces of manilla paper tacked to suitable frames; upon these arcs were described and divided into spaces of 5° each. At the centers small pulleys made of perfectly round sections of corks were placed and so arranged as to revolve with the utmost ease. By properly fastening a strip of manilla paper to the large square piece, the cork pulley was easily held in place by a pin passing through the strip and exactly through the center of the cork and the center of the arc, the pin turning in the paper supports, but being fixed in the cork. To the cork a delicate finger made from a straight "splint" of a common corn broom, was attached to serve as an index. A silk thread to be attached to the plant whose growth was to be observed was wound once around the pulley, and to the free end a weight heavy enough to little more than counter-balance the index, was attached.

It took but little longer to make these two instruments than it has taken me to describe them. I immediately put them in place twelve inches or so above a couple of young bean seedlings (*Phaseolus* sp.)

*The same as the mold spoken of in a previous foot-note.

growing in my study window, and for a week watched them and noted results. I made a careful observation four times every twenty four hours, viz: at 8 A. M., 12 M., 4 P. M., and 8 P. M. Indicator No. 1 was attached to a very young internode, while No. 2 was attached to one which had already elongated somewhat. The silk thread was carefully looped under the bases of the leaf stalks at the summits of the internodes, in such a way as not to produce a constriction of the stem. The record was kept in degrees of the arcs, and was transferred to profile paper, the horizontal distance representing time and the vertical the aggregate growth. In this way instructive diagrams were obtained for study and comparison. It was at once evident that the curve of growth for the day was much steeper than that for the night, the percentages ranging from day growth 59.6 and night growth 40.4, to day growth 52.2 and night growth 47.8. These figures can convey scarcely any idea of the constant and marked difference between the day growth and night growth as shown in the curve of growth upon the diagram. By modifying the attachment of the thread, by attaching several instruments to different internodes of the same plant, or by varying the treatment of the plant, as by increasing or decreasing the temperature, or the amount of water supplied to it, the pupil will be able to find out many interesting things about the growth of plants, with a little outlay of time, and none at all of money for apparatus. — C. E. BESSEY, *Ames, Iowa.*

TRICHOSTEMA PARISHI, Vasey. — Shrubby and much branched below, 2–3 feet high, canescently puberulent; leaves sessile, lance-oblong, 1–1½ inches long, tapering to a narrow base, obtuse, sparingly tomentose beneath, with fascicles of linear leaves with revolute margins in the axils; floral leaves 1 inch, gradually reduced to bracts. Thyrsus 6–12 inches long, lower cymules 1–1½ inches apart, closer above, each consisting of 5 to 8 flowers, the peduncles 2 to 4 lines long, pedicels about 2 lines, the purplish wool of calyx scanty compared with *T. lanatum*. Corolla 5–6 lines long, the lower lobe rather longer than the upper, filament 9–12 lines long.

Differs from *T. lanatum* in the shorter and broader leaves, longer and more slender thyrsus, with the cymules more open and much less woolly, the flowers smaller and filaments shorter.

Named for Mr. S. B. Parish, of San Bernardino, Cal., one of the discoverers. Found in San Diego Co., Cal., by *Mr. S. B. Parish* and *G. R. Vasey*. — GEO. VASEY.

BOTANY OF CALIFORNIA, VOL. II, by Sereno Watson. — The authors of this great work are to be congratulated upon its successful completion. The dress is admirable, with fine paper, clear type and broad margins, doing credit even to the famous University Press. The appearance of such a work always makes a stir in botanical circles, for it is a partial record of the progress of systematic botany up to the date of going to press. It is with peculiar satisfaction that we welcome this second volume, for it marks a completed work, and

our shelves are too much filled by those that are incomplete. Works upon Polypetalous orders are multiplied; Gamopetalæ have less of a showing; while Apetalæ and Monocotyledons are really poverty stricken. For some years hence our systematists in beginning their great works should scrupulously begin with Endogens and write their last volume first. The present volume carries the flora of California not only through Monocotyledons, but through Mosses. No state is so well provided with a botany as California, but it does not follow that all states should follow her example for it would be a useless expense and multiplication of books. No other state so well deserves a separate and complete botany. It naturally includes our whole Pacific coast and thus is the flora of a very distinct geographical area.

As usual the work of the volume has been parcelled out among specialists, Mr. Watson bearing the chief burden. Most of the changes in nomenclature have been made and the new species described before the issue of the present volume, being recorded in the proceedings of different scientific societies. But this sort of information is much scattered and the grouping together of the little changes of years gives a proper impression of the amount of work that has been done, and puts it into a usable form.

We will note some facts and changes that catch the eye in a hasty turning of the leaves, changes that for the most part are original with this volume.

Polygonum amphibium, var. *terrestre* becomes *P. Muhlenbergii*. Of the 102 known species of *Eriogonum*, 55 have already been found in California. Two species belong to the South Atlantic States, two to Mexico and the rest of the genus is found between the Mississippi and the Pacific.

Chenopodium is made to include *Blitum*, and *B. maritimum* of the Manuals is *C. rubrum*.

A near relative of *Dirca palustris* has at last been found and called *D. occidentalis*. Our Sycamore is represented in California by *P. racemosa*. Several new Euphorbias come from the safe hands of Dr. Engelmann, who also now recognizes as species what ranked before as varieties of *Quercus lobata* and *Q. chrysolepis*. These new oaks bear names that repeatedly appear in California botany, viz.; Drs. Brewer and Palmer. *Taxaceæ* apper as an order distinct from *Coniferæ*, and *Abies* is so broken up that for a time we can hardly get our bearings. For *Abies Douglasii* we must say *Pseudotsuga Douglasii*; *Abies Menziesii* is *Picea Sitchensis*; while other well known species of *Abies* appear under the generic name of *Tsuga*.

The abundant and well known *Pinus ponderosa* of the Rocky Mountains is now only the variety *scopulorum* of the true *P. ponderosa*. Out of eight Californian Habenarias Mr. Watson names six, and out of the 23 Alliums, 15 must look for their author to the same indefatiguable worker.

The many changes and additions among the *Liliaceæ* were fully noted in the GAZETTE for August, 1878, in a review of Mr. Watson's "Revision of N. A. Liliaceæ."

The "Skunk Cabbage" of California rejoices in the name of *Lysichiton Kamtschatcensis.*

Lemna Torreyi of the Manual is *L. Valdiviana*, Philippi; and we are reminded that *L. polyrrhiza* was long since changed to *Speirodela polyrrhiza.*

Two genera of palms are described, *Washingtonia* and *Erythea.*

Of the genus *Carex* we find 78 species, some 10 or 11 being described here for the first time by Mr. Wm. Boott.

We confess to a good deal of interest in looking over the *Gramineæ* by Dr. Geo. Thurber. Not so many changes appeared as we had anticipated and we were glad to see that the ordinary terms were employed and not those involving theoretical views of the structure of the flowers. Several new species are well distributed among as many genera. *Brizopyrum spicatum* appears as *Distichlis maritima.*

Ophioglossaceæ appears as an order distinct from *Filices.* The progress in our knowledge of the classification of Ferns has been noted from time to time in reviews of Prof. Eaton's great work.

The genus *Azolla* instead of, as usual, appearing under the order *Marsiliaceæ*, is separated under the order *Salviniaceæ.*

That the flora of California has not been exhausted is witnessed by the fact that during the four years that have elapsed between the publication of the two volumes, new material enough has been collected to make over 60 pages of "Additions and Corrections." In these 60 pages of course we find the very latest information. The California *Trautvetteria* is made a distinct species and now the genus stands with three species, one on the Atlantic coast, one on the Pacific, and one in Japan. A new species is described under *Dicentra, Corydalis, Trifolium, Rosa*, while *Draba* has three additions. A new genus of *Cruciferæ* is dedicated to Mr. Leland Stanford, one of the patrons of the "Botany of California." It is called *Stanfordia.* A good many *Compositæ* are added, largely the result, we suppose, of Dr. Gray's recent study of that vast order. On page 485, *Erythea*, Mr. Watson's genus of Palms, is unfortunately printed *Erythrea*, which makes it look too much like *Erythræa.*

All botanists should possess this complete work which is exceedingly cheap when we consider the matter and workmanship. By addressing Mr. Sereno Watson at Cambridge, Mass., botanists can procure either or both volumes at $5.00 each. – J. M. C.

FRANCIS DARWIN ON PHYSIOLOGY OF PLANTS.—Abstracts of two important papers read by Francis Darwin before the Linnean Society, appear in *Nature* for Dec. 23.* "Both bear on the relationship between the external and internal conditions of life, between external forces such as light and gravitation, and the constitution of the organism on which these forces act."

I. The behavior of leaves under the action of light may be illus-

*I. "The Power possessed by Leaves of placing themselves at Right Angles to the Direction of Incident Light." II. "The Theory of the Growth of Cuttings, illustrated by observations on the Bramble, *Rubus fruticosus.*"

trated by the cotyledons of the seedling radish. If illuminated from above they take a horizontal position, standing thus at right angles to the light. If lighted obliquely from above one becomes depressed and the other elevated, so as to assume again the position at right angles to the incident light.

The two theories which have been proposed to account for this tendency bear the names of Frank (1870) and de Vries (1872), the latter endorsed by Sachs, with modifications, in 1879. Frank supposes a certain sensitiveness to light, which he calls "transverse-heliotropism," to be an inherent tendency in leaves and some other parts of plants, which causes them to assume a position at right angles to light, just as heliotropism inclines them to parallelism with the rays. A similar difference is shown in the tendency of aerial stems to grow upward, and of rhizomes to grow horizontally.

De Vries considers that the ordinary forces of heliotropism and geotropism may so balance each other as to keep horizontal the leaves of a plant lighted from above. Modes of growth may also assist in maintaining this equilibrium. For instance epinasty may be opposed by heliotropism and hyponasty by geotropism.

Darwin's experiments were made with a view to test these two theories. In order to be rid of the disturbing element, the force of gravitation, he used the klinostat, an instrument in the use of which the plant is fastened to a horizontal spindle and illuminated from the direction of the axis. By clockwork the spindle is kept in steady but slow rotation. If a plant which has been previously illuminated from above be fastened with its axis parallel to the axis of the klinostat, and the direction of the incident light, according to Frank's theory the leaves ought to remain stationary, but according to de Vries and Sachs they ought *not* to be able to retain the rectangular position. The results with *Ranunculus ficaria* were decidedly in favor of Frank's theory. The leaves of this plant, which are sometimes extremely epinastic, moved forward until approximately at right angles to the light and then came to rest. Again, when the plant had been placed in the dark so as to compel the leaves to point upwards, and then placed on the klinostat, the leaves turned backward till again at right angles.

A series of experiments with seedling cherries seemed to lead to a somewhat different result. When placed on the klinostat the leaves were unable to keep their horizontal position, but became parallel to the stem of the plant.

He concludes that transverse-heliotropism is really the important influence at work, and that this sensitiveness to light is sufficiently strong in the case of the Ranunculus to determine the position of the leaves, notwithstanding the annihilation of heliotropism. The cherry, when growing normally, he believes to trust to the approximate equilibrium between epinasty and heliotropism, which is made complete by the influence of light. "But when the balance is disturbed by placing the plant on the klinostat, the light stimulus is not strong enough to produce a condition of equilibrium."

II. The second paper considers the two theories to explain the tendency of cuttings to produce roots near the *basal* end,* and buds near the *apical* end. Vochting ("Organbildung im Pflanzenreich," Bonn, 1878) believes this tendency to be innate, and growth-inherited. Sachs, in a late paper (Arbeiten des bot Inst. Wurzburg, 1880, p. 452) opposes the theory of Vochting *in toto* and conceives that Vochting's morphological force is really a tendency impressed upon the forming cells by the action of external agencies, especially that of gravity.

Darwin observed carefully the rooting of the species of the sterile shoots of brambles growing on steep banks. In such positions the majority of the branches grow immediately downward or straggle out horizontally and then turn downward. But some grow uphill, yet he finds the tips of many of these branches, indifferent as to position, taking root. The gravitation impulse therefore seems not to be applicable to such a case. Mr. Darwin then proceeds t · show that it is better for the plant that the morphological growth-impulse should determine the formation of roots at the tip than that root formation should depend on the guiding force of gravity. Injury is most likely to occur at the end of the branch. The new shoot that is to be produced to perform the function of the original branch will have the best chance of success if it starts from the point reached by that branch before the injury ; therefore the growth of the bud nearest the apex is the most advantageous for the plant.

It must be remarked that some of the conclusions drawn, if Mr. Darwin is correctly reported by *Nature*, do not seem warranted by the result of the experiments, but it would be hardly just to criticise a paper from a mere abstract. – C. R. B.

PERONOSPORA VILICOLA, DeBary. – American grape vines having been introduced into Europe, with the expectation that they would better withstand the attacks of *Phylloxera*, have carried this parasite with them, and within two years it has spread over all the vine growing countries.

It was first found in Hungary in 1877 ; in 1878 in South-western France ; in 1879 it occurred in a number of provinces, and in 1880, everywhere, doing immense damage. In 1879 it was discovered in Italy and Switzerland, and in 1880 in Tyrol, Steyermark and Lower Austria. *Vide Hedwigia.* – E W. HOLWAY.

A NEW GRASS. – While on a botanical trip with my friend H. N. Mertz around Lake Chautauqua, N. Y., last summer, we found on a road at Fairpoint upon the "Association grounds" a grass which puzzled us considerably. It was an annual with tufted, linear root leaves 4·5 inches long ; slender, leafy culm 15-18 inches high, ending in a narrow spike about two inches long, consisting of numerous 5–6 flowered spikelets each enclosed *within two ovate pinnately-divided bracts* (*glumes?*).

*That end originally nearest the body of the parent plant.

Satisfied that this must be a recently introduced grass I sent a specimen to Dr. Geo. Thurber who considers it an important find. It is *Cynosurus cristatus*, Linn., the "crested dog tail grass," rather common in Europe, but heretofore not reported in the U. S.

Botanists who visit Chautauqua this year are requested to be on the lookout for this grass in order to ascertain whether it can hold its own and can be considered as thoroughly established.—G. GUTTENBERG.

PODOPHYLLUM PELTATUM.—I believe the May-apple is exclusively a native of North America, but it is found in great profusion from the northern to the southern boundaries of the United States. Now it is precisely because this plant is so very common that nothing is said of its beauty or virtues. Why it has been given the name of May-apple would be difficult to conjecture, as it rarely blooms before June, but occasionally I have found it blooming about the end of May. It delights in moist, rich soil, and is always most luxuriant in damp, shady woods. Its fruit is never ripe until the latter part of September, and indeed the plant is propagated so abundantly by the creeping of its roots, that Dr. Barton says only a small proportion of its flowers produce fruit. What the cause of it is I do not pretend to know, but the fact remains the same, that while I am well acquainted with the flowers of this plant, I have never seen the fruit more than once or twice. In May 1879, I noticed large patches of its light green leaves above, and pale beneath, supported on yellowish green stems about a foot high. Later on when the plants are in flower, the drooping habit of these blossoms found in the fork that the junction of the petioles makes, gives to the whole bed an elegant appearance. The number of its white petals varies from six to nine, and they are thickly laced with vein. The pistil is of a yellowish color, and crowned by a stigma much darker. The stamens vary from thirteen to twenty, and are yellow. The fruit that I have seen was small and about the color of a half ripe lemon, but Dr. Barton says, 'the size varies according to the different situations the plant may have been grown in, and when mature is lemon yellow slightly maculated with round brownhsh dots."

The proper time for collecting the roots for medicinal purposes is after the leaves have fallen. Porcher says in his "Resources of the Southern Fields and Forests," that the pulp of the fruit when squeezed into a wine glass and with the addition of sugar and old Madeira, is said to be equal as a drink to the luscious golden granadilla of the tropics. Many people like the taste of the fruit when eaten, without other flavor than its own.—E. HUNTER, *Essex Co., Va.*

RECENT PERIODICALS.—*The American Naturalist* for January is strong in Botany. Mr. William Trelease has been studying the Fertilization of *Calamintha Nepeta* and finds it cross-fertilized by many insects, though capable of close-fertilization in one or two unlikely

ways. The flowers are not fully proterandrous, as the stigma becomes receptive while some pollen still remains in the anthers. Protection against "unbidden guests" is afforded by the fine pubescence on stem, leaves, calyx and corolla, while a dense *chevaux de frise* of hairs guards the corolla tube. Rev. E L. Greene gives his second paper on "Bot anizing on the Colorado Desert," in which he makes one desirous of possessing the desert plants but not of collecting them. Prof. W. J. Beal has an illustrated article on the "Method of Distinguishing Species of Populus and Juglans by the Young Naked Branches." The suggestions are good and the thing seems perfectly practical and wonderfully convenient.

Bulletin of the Torrey Botanical Club appears for January in a new cover and with a general appearance of enterprise. A plate accompanies Mr. Francis Wolle's article on New American Desmids. Prof. Eaton has the ninth installment of "New or Little Known Ferns of the U. S." Mr. E L. Greene describes a new *Asclepias* from Arizona.

The Monthly Microscopical Journal for January shows also marks of improvement in smaller, clearer type, giving a pleasanter appearance and more matter. Every botanist who works with the compound microscope should not fail to subscribe for this Journal.

CATALOGUE OF THE FLORA OF INDIANA.—With this number of the GAZETTE we begin issuing in the form of extras a catalogue of Indiana plants. When no range is indicated the plant occurs throughout the state. When the term "North" or "South" is used. the plant has been found in the northern or southern part of the State. In other cases there is given simply the names of counties from which the plant has been reported. Of course many Indiana botanists will see that counties have not been credited that should be, but we have on hands no proof that the plants grow anywhere but in the places mentioned. Possibly this manner of publication will bring us the desired information, for botanists often begin to send notes after publication has been begun. We would call on them again to send any names or specimens they may possess that all additions necessary may be made in the closing pages. Whenever a new name is sent to be inserted in the catalogue a specimen should always accompany it. A moment's reflection will show the necessity of this in making an authoritative catalogue. Every name in the catalogue should stand for an actual specimen, a specimen that can be produced for examination at a moment's notice. While we do not doubt that many botanists in the state are as competent to pronounce upon a specimen as we are, the line must be drawn somewhere or we would be overwhelmed with spurious names and the catalogue become worse than useless. It is to be distinctly understood then by botanists in general that this catalogue stands ready with its proofs in every case.

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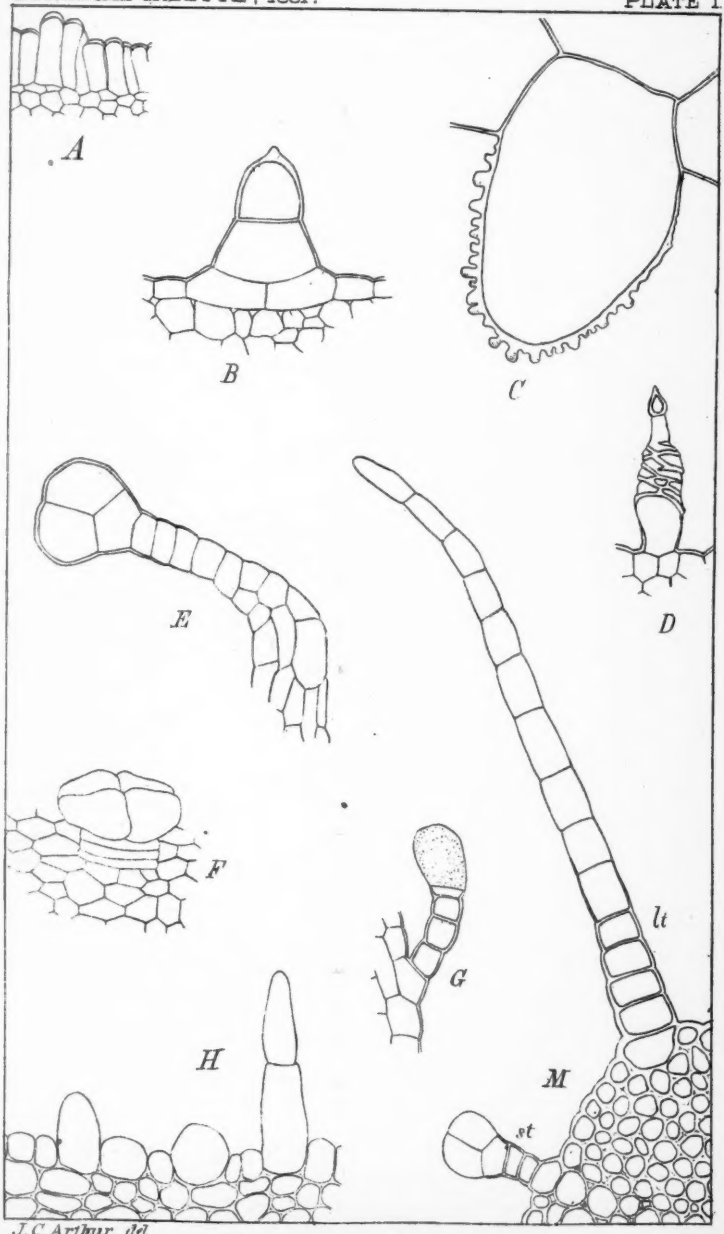

J.C. Arthur, del.

ARTHUR ON TRICHOMES.